ATOM USERS' GROUP CANADA
Newsletter #2

Some of the original aims of the Users' Group are beginning to be met. Members are writing in with their ideas to contribute and others are saying that they have been helped. Keep it up! The more input and feed-back from members the better will the Newsletter reflect peoples needs. I try to answer all letters, but sometimes it takes quite a time to get round to it, and occaisionally the response is printed as part of a Newsletter.

One of the goals was to encourage local meetings. A local group has been formed in Halton Region. See the report of their first meeting inside. Contact was established with a group of Atom users at Honeywell and Vince Scarpelli of Honeywell has joined the National Users' Group.

With this issue you will receive more names of members from your part of the country. In Ontario this will be an update to names sent with NL #1. In other parts of the country it will be a new list. Many members of the Users' Group have mentioned that they are also radio amateur operators. If others are also hams and would like to have their call sign added to their name in the membership listing, write to let me know.

Back issues: New members wishing to receive back issues of the Newsletter may obtain NL #1 and NL #0 together by sending $3.00.

John Wood
January 1983

This Newsletter is published by Atom Users' Group Canada,
812 Cabot Trail, Milton, ONT. L9T 3M8

Contents

Many thanks to the following who sent items for the Newsletter:
Fred Springer -Burlington ONT., Paul Preto -Chilliwack B.C.,
W.J. Myles -Toronto ONT., Robert Paquette -Chelmsford ONT.
Bill Carew -Peterborough ONT., Bill Munroe Welland ONT.

LOCAL GROUP NEWS

The Halton and Surrounding Region Users' Group met on Tuesday December 21, 1982 at St. Peter's School in Milton. There were fifteen people who showed up from as far away as St. Catharines.

The meeting centered on the uses various people were making of their machine. Four of the people in attendance were Radio Ameteur Operators and were interested in using the Atom to send and receive Morse code. Programs are available from them for this purpose. One member has designed and is using a board which will take up to 3 utility ROMs as well as 4K of RAM.

Also on the agenda was a demonstration of the Smith Corona daisy-wheel printer and the Microline dot matrix printer - both running on the Atom. These are available from Niagara MicroComputer in Fenwick, Ontario (416) 892-8451 or 735-7998.

The programs of the winner of the national Users' Group competition were demonstrated. These programs are available from the national Users' Group.

This local group will meet again on February 1, 1983 at the same location at 7:30 pm. At this meeting Al Hepburn will be giving a talk on Peek and Poke on the Atom. We're looking for additional participation. If you are free that night come along and bring a friend.

Fred Springer

Contact Fred for details of future meetings.
Tel. (519) 853-3730 -Bus. (416) 632-2044 -Home.

It is hoped that the National Users' Group will accumulate a library of software which is in the public domain. The programs available to date are from the competition in NL-#0 and the the text processor from Robert Paquette, in this issue. Listings of such programs will be sent to members just send a stamped addressed envelope. Sheer logistics would prevent cassettes from being sent to all those who might want them. However cassettes could be sent to local groups affiliated to the National Users' Group.

A significant part of the cost in publishing the Newsletter is the cost of postage. Local groups can alleviate part of this cost by having a bundle of Newsletters sent to one address. If you think that there might be support for such a group in your area you may well be right. The Halton Region local group started with a nucleus of four people and fifteen showed up at their first meeting. If you can arrange for a meeting room I would be happy to send out a notice to all members in your area, including those who have chosen not to have their name published.

It would be good to see local groups starting up all over the country, but it may be some time before there are enough members up in Resolute Bay N.W.T. to help Eric Hameister there to form a local group.

INTERESTING ADDRESSES

There is a group of addresses which allow allow programs to be stored and used in different parts of the memory and which can be used together to provide auto-running of programs, even when these programs contain arrays.

?#12 contains the text space pointer, normally #29 in an expanded Atom. The use of this location to select different areas of memory is discussed in section 18.6 of A.T.&P on page 135.

?#0D and ?#0E contain TOP

?#23 and ?#24 contain the first free memory location after the array space. The low byte of this address is stored in ?#23 and the high byte in ?#24.

These four locations are set automatically by the Atom on typing NEW or OLD and when entering programs using a straightforward LOAD command. But, not when loading unnamed files using *LOAD. To reset TOP after a *LOAD you should type END. This is particularly important if the program dimensions any arrays or strings. Otherwise the arrays would overwrite the program itself.

?#CE86 contains the entry point for the RUN routine for a BASIC program. It is fairly staightforward to save a program, which does not contain DIM statements, on tape then later to reload it with auto-run. Before saving, find TOP by typing: P.&TOP. Then save the program using:

```
*SAVE "FILENAME" 2900 XXXX CE86
```

where XXXX is the value given for TOP.

To load and run the program type:

```
*RUN"FILENAME"
```

and play the tape.

If the program contains arrays or dimensioned strings the situation is somewhat more complicated. Both TOP and the array space pointer must be set in the program before any dimension statements. The program itself must contain the value for TOP.

The following lines if entered at the beginning allow any BASIC program to auto-run:

```
1 !80=#XXXX
2 ?#0D=?#80;?#0E=?#81
3 ?#23=?#80;?#24=?#81
```

When the program is complete print out &TOP and enter the value in place of XXXX in line 1. Then save the program as before with

```
*SAVE "FILENAME" 2900 XXXX CE86
```

Where again XXXX is the value found for TOP. The dummy value XXXX is written in line 1 so that the value of TOP will not change when the correct value is entered.

TEXT PROCESSOR   by Robert Paquette

```
 10 GOTO 100;BY ROBERT PAQUETTE
 20 MUST NOT BE USED WITH TOOLBOX
 30 WORD PROCESSOR PROGRAM WITH STORAGE STARTING AT #8200
 40 #90-#91 ADD.FOR TEXT. #92 Y TEXT POINTER
 50 #93 BUF. POINTER. #94 LINE COUNTER. #95 END OF SCREEN.
 60 #96 SPARE. #97 MARGIN. #98 BELL. #99 TEMP. STORAGE.
 70 LL MAIN PRGM. CC BINA.TO ASCII FOR LINE #
 80 EE BINA.TO ASCII FOR COLUMN #.
 90 DD BOTTOM SCREEN POKING. FF MARGIN AND BELL CHECKING.
100 P.$12" DO YOU WISH A 2.5 CM OR 5 CM"'"MARGIN.INPUT 1 OR 2"
110 IN.A;IF A<1 OR A>2 G.100
120 IF A=1; ?#97=63
130 IF A=2; ?#97=43
140 ?#98=?#97-10
150 ?#90=0;?#91=#81;?#92=0;?#93=0;?#94=0;?#95=0;?#96=0
160 DIM CC4,DD3,EE4,FF4,LL12,P-1
170 LL2=P;CC3=P;EE3=P;LL11=P
180P.$21;F.N=1TO2;DIM P-1
190[
200:DD0 LDA @12;JSR #FFF4;STA #81E0;LDA @9;STA #81E1
210 LDA @14;STA #81E2;LDA @5;STA #81E3;LDA @58;STA #81E4
220 LDA @3;STA #81EA;LDA @15;STA #81EB;LDA @12;STA #81EC
230 LDA @21;STA #81ED;LDA @13;STA #81EE;LDA @14;STA #81EF
240 LDA @58;STA #81F0;RTS
250:FF0 CPX #98;BNE FF1
260 STA #99;LDA @7;JSR #FFF4;LDA #99
270:FF1 CPX #97;BNE FF2;JMP LL2
280:FF2;JMP LL11
290:CC0 LDA #94;LDX @0
300:CC1 CMP @10;BCC CC2;SBC @10;INX;JMP CC1
310:CC2 PHA;TXA;ADC @#30;STA #81E6;PLA
320 CLC;ADC @#30;STA #81E7;RTS
330:EE0 LDA #93;LDX @0
340:EE1 CMP @10;BCC EE2;SBC @10;INX;JMP EE1
350:EE2 PHA;TXA;ADC @#30;STA #81F2;PLA
360 CLC;ADC @#30;STA #81F3;RTS
370:LL2 JSR #FFE3;CMP @3;BNE LL3;LDY #92;STA (#90),Y;RTS
380:LL3 CMP @13;BNE LL8;LDX @0
390:LL4 CPX #93;BNE LL6;LDY #92;BNE LL5;INC #91
400:LL5 LDA @13;STA (#90),Y;INC #92;JSR #FFED;JSR #FFED
410 LDX @0;STX #93;INC #94;INC #95;LDY @5;CPY #95
420 BNE LL10;STX #95;JSR DD0
430:LL10 JSR CC0;JSR EE0;JMP LL2
440:LL6 LDY #92;BNE LL7;INC #91
450:LL7 LDA #140,X;INX;STA (#90),Y;INC #92;JMP LL4
460:LL8 CMP @127;BNE LL9;DEC #93;BMI LL12
470 JSR #FFF4;JSR EE0;JMP LL2
480:LL9 LDX #93;JMP FF0
490:LL11 STA #140,X;INC #93;JSR #FFF4;JSR EE0;JMP LL2
500:LL12 LDX @0;STX #93;JMP LL2
510]
520 N.;P.$6;LINK DD0;LINK LL2
530 END
```

Type in the text as on a typewriter. Exit by typing control C.

Text Printer Routine

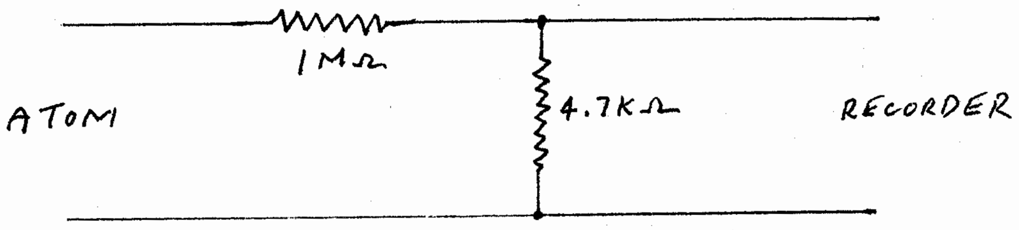
The following routine can be used to output text from the text processor program by Robert Paquette, using the regular printer port.

```
   10 DIMP(-1)
   20 V=#FEFB
   30[;LDA #96;JSR V;RTS;]
   40 P.$2
   50 A=#8200
   60 FORN=0TO?#94
   70 P."      "
   80 FORJ=0TO LEN A
   90 ?#96=J?A
  100 LINK TOP;N.J
  110 A=A+1+LEN A;N.N
  120 P.'$3
  130 END
```

In addition to the programs given here, Robert has devised the hardware to connect his Atom to a Teletype printer using the cassette port. He has offered to make this information available together with his routines for listing programs and printing text.
Write to him at: Box 2, RR #1, Chelmsford, ONT. P0M 1L0

HAPPY LOADINGS

Most members of the Users' Group seem to have difficulty at one time or another with loading and saving programs on cassette. It is planned to have a section on saving and loading in the next issue of the Newsletter. If people will write in with ideas they have found helpful, these can be published for the benefit of every-one.
Here is one tip for starters.
The signal voltage put out by the Atom is much higher than that needed by many cassette recorders, although these are very tolerant of excess voltage. The voltage can be reduced without touching the Atom by putting a simple voltage divider in the line from the Atom to the recorder.



The resistors shown have been used with success. You may find that other values suit your set up better.

Review:

PROGRAMMER'S TOOLBOX from Program Power

The "Toolbox" is a 4K EPROM which is fitted in the utility ROM socket (IC 24). It has no effect on the use of the Atom until it is brought into operation with LINK #AF00 or LINK #AF04. A whole set of new commands then become available. Perhaps the most significant of these is VECTOR which allows the cassette operating system to be set to 1200 Baud or reset to the normal 300 Baud. The higher speed is automatically initiated if LINK #AF00 is used, or it can be brought in with VECTOR 1. VECTOR 0 reverts to 300 Baud. The higher baud rate is similar to the FAST COS reviewed in Newsletter #0. In fact the two systems are compatible and programs saved using FAST COS may be loaded using the toolbox VEC. 1.

Some 25 other commands or command pairs become available. If you have ever missed a command which is available in another BASIC, it is probably available on the Atom with this toolbox. Some commands are used when actually writing a program. Others can be incorporated in programs.

Examples of the first kind are: AUTO which gives automatic line numbering. RENUMBER which will renumber a program using specified, or default values for start and step. GOTOs and GOSUBs are changed to match the new line numbers, and computed jumps such as GOTO (A+3*B) are listed to allow manual editing. DELETE X,Y deletes lines from X to Y. VAR and LVAR will print out the value of the varibles A to Z, on the screen or on a printer, either in decimal or hexadecimal. HEX and IHEX tabulate specified parts of memory in hexadecimal, either with the ASCII equivalent, or in object code format with 1,2 or 3 bytes per line depending on the number of bytes required by the instruction represented by the first byte on the line. (for machine code). DUMP enables a printer and prints out the contents of the screen line by line. (Except graphics).

If your Atom has the VIA chip (6522) and link 2 (the IRQ link), then, STEP, TRACE, and LTRACE provide various ways of keeping track of a program as it runs. (Useful for debugging).

Some of the commands which can be used in programs are: BEEP which greatly simplifies the generation of sound effects by allowing both the pitch and duration of the sound to be specified.(The program on KIDS PAGE illustrates this, but of course, only those with Toolbox will get the sound effects). CURSOR allows the cursor to be repositioned equivalent to a PRINT AT type of command. KEY and INKEY allow keyboard scans with or without waiting for a response. POP removes referance to the current subroutine allowing you to jump out without danger of an ERROR 2. XIF...THEN...ELSE allow you to include lines which are only excecuted when the preceeding XIF statement is false. WHILE...ENDWHILE is an inverted version of the DO...UNTIL loop. READ...DATA...RESTORE allow data in the form of constants, strings, or expressions to be read from DATA lines anywhere in the program.

A complete list of the commands is given below.

AUTO	BEEP	CURSOR	DATA
DELETE	DUMP	ELSE	ENDWHILE
FIND	HEX	IHEX	INKEY
KEY	LTRACE	LVAR	OFF
ON ERROR	POP	READ	RESTORE
RENUMBER	STEP	STOP	TRACE
VAR	VECTOR	WHILE	XIF
ZERO			

If you are into writing your own programs, you wil find Toolbox to be invauable. However it fits in the IC 24 socket which is also required for WORDPACK, so if you require both you will need the capability to switch between the different ROMs. A review of one or other of the ROM selector boards will be published in an upcoming issue of the Newsletter.

MORE MEMORY

The Acorn Atom almost invites you to take the back off and start adding to the hardware. None of the memory expansions come ready to plug in an expansion port on the back of the machine. In fact there is no 'expansion port as such. However, once you pluck up the courage to take the back off, additions are not difficult.

The simplest expansion to an unexpanded Atom is to add 2114-L static RAM chips. These must be added in pairs, as described on page 21 of the Atom Technical Manual. The limit to this "on board" expansion is 12K, and many readers have the so called expanded Atom with 12K RAM and 12K ROM. A popular next step is one of the memory expansion boards from Timedata.

The Timedata board comes in 16K and 32K versions which fit inside the Atom, but use these numbers carefully! If you are in the market for more memory make sure you know just what you are getting. The 16K board is staight-forward. It can be configured to sit in memory at #2800 to #67FF, or at #3C00 to #7BFF. The former would be appropriate for an Atom with no lower text space, and the latter for an expanded Atom. In both cases you get full benefit from the extra 16K. However, the 32K board occupies the whole of the memory from #0000 to #7FFF. This replaces any lower text space memory and also the block zero RAM from #0000 to #3FF. These chips must be removed and, unless you can use them to expand your graphics memory, they become redundant. As much of the available firmware and software, such as Wordpack, Atomcalc, and Atomstore all assume memory starting at #2800, there is very little advantage in having the larger board (but note the comments on power requirements). In fact there is reason for not comleting the last block from #7BFF to #7FFF. This gap prevents data or programs from conflicting with screen memory, which could cause corruption of data.

Good documentation is provided with complete intstructions for installation. The most difficult part is the soldering of a 32 way connector to PL7. A steady hand and a fine soldering iron are required for this operation. Then it is a matter of adding some wire links in IC sockets or of adding the bus buffer ICs and connecting a power supply.

The standard versions of the Timedata board MZ163A (16K) and MZ163B (32K) use 200ns 4116 dynamic RAM memory chips. These require power supplies of +5V, +12V and -5V. If you have a power supply capable of providing these voltages fine. Just in case you don't the MP100 is a DC/DC converter which gives the necessary voltages from a standard Atom 8V supply.

The MZ163 with the MP100 riding piggy back fits inside the Atom case and requires no attention from the programmer. There are a couple of snags, one minor and the other not so minor. First the minor one. On switching on, the dynamic RAM always starts as zero. This does not matter unless you have the full 32K board. But if you do, you may find that the random number seed ?#8-?#C starts as zero then gives zero whenever a random number is called. On the other hand, if you add a 16K board to an expanded Atom, you may overload the power supply. As dynamic RAM uses less power than static RAM this does not happen with the 32K board and the existing lower text space RAM removed.

If you have already changed your power supply to a regulated 5V or use the 5V from the disc drive, then the MP100 cannot be used but there are two other boards the MZ163F (16K) and MZ163G (32K) which utilise 4816 memory chips and require only a 5V stabilised power supply.

Paul Preto of Chilliwack, B.C. sends the following:

If you want to make a fast (1200) baud copy, or any back up copy of commercial tapes (for your own use of course) use the *CAT command. By using *CAT and running the first and last blocks on the tape you can find the starting address and end address. This technique also gives you the excecution address if the program is one which is *RUN.

eg.

```
First block: "EXAMPLE" 2800 XXXX 0000 FF
Last block : "EXAMPLE" 2F00 XXXX 0007 7A
```

This can then be saved with:

```
*SAVE "EXAMPLE" 2800 2F7B XXXX
```

Note that the last address is found from the second block by adding 2F00+7A+1. Of course on your program these numbers may be different.

FOR SALE

The Users' Group has located a small number of Centronics 930 printers, similar to that used to print this Newsletter. These are used, demonstration units but carry the manufacturers guarantee.

Price: $325. Ontario residents add 7% PST.

Contact the Users' Group

SUBROUTINE TO ROUND NUMBERS 0 TO 6 DECIMAL PLACES

```
   50 GOSUBz
    .
    .
  200 %V=*****;GOSUBr
  300 END
 8999 REM ROUNDS 0 TO 6 DECIMAL PLACES
 9000r$T="00000000";FIF %V<5/S $T=$T+LEN(T)-R;$G=$T;GOTOp
 9010 FIF%V>%U;FPRINT%V"  TOO LARGE"'"ROUNDED VALUE"'"BEFORE "
 9020 FIF%V>%U;INPUT"DECIMAL"$G"AFTER DECIMAL (TRAILING 0'S"'
 9030 FIF%V>%U; IF R=0 P." OR, IF ROUNDING TO 0 PLACES, CR"'
 9040 FIF%V>%U;INPUT"BUT NO DECIMAL)"$H;$G+LEN(G)=$H;GOTOp
 9050 %V=%((%V*S+5)/10);STR%V,G
 9060 $T+LEN(T)=$G;$G=$T
 9070pJ=LEN(G);FOR O=0 TO LEN(G);IF G?O=46 J=O
 9080 NEXT;$G+J="";$H=$G+(LEN(G)-R);$G+(LEN(G)-R)=""
 9090 PRINT $2 VAL$G"."$H;PRINT '$3;RETURN
 9100zINPUT"ROUND TO HOW MANY PLACES"R
 9110 DIMT64,G64,H64
 9120 S=10; IF R>0 FOR O=0 TO R-1;S=S*10;NEXT O
 9130 %U=99999999/S;RETURN
 9999 REM 50 GOSUBz
```

Labels used:• p,r,z
Variables: J,O,R,S,%U,%V,$G,$H,$T
Description of Program:

```
  50          Gosub to establish number of places
 200          Assign value to be rounded to %V
9000          Provide extra zeros to fill empty areas after the
              decimal. Establish value for very small numbers.
9010 - 9040   Arrange for input of rounded values to high for the
              programme to handle.
9050          Round off. Assign value to string.
9060          Add extra zeroes to front of rounded value.
9070          Look for decimal in string.
9080          Shorten $G to the required length, assign value to
              the right the right of the decimal to $H and shorten
              $G by the equivalent number of characters.
9090          Turn on printer and print rounded value.
9100          Input number of places to be rounded to.
9110          Dimension strings.
9120          Establish value to create integer containing the
              required number of digits in Line 9050.
9130          Largest number that the programme will round.
9999          Remark line containing Line 50 to save typing in
              each time.
```

NOTE: This subroutine is not foolproof. Errors may occur if there are more than eight digits in the number being rounded. No checking functions are built in to check the number of places being rounded to or whether an incorrect number of digits are input in lines 9010 - 9040.

Submitted by: W.J. Myles

COMPETITION RESULTS

Our competition for young people attracted surprisingly little support. In fact not one entry was received in the section to write a Tic-Tac-Toe game. However the quality of programs sent in for the TURTLE graphics game section was very high.

The winner was Bill Munroe of Welland Ontario. His program is listed below.

```
10 DIM A5,LL10,V5,P-1
20X=65;Y=65;K=12;L=0
25P.$12$21
26[
27:LL0 JSR #FE71;STY #82;RTS;]
30P.$6
31P.''"TURTLE---BY BILL MUNROE"''"CONTROLS---UP -- ["'
32P."         DOWN -- /"'"         LEFT -- Z"'
33P."        RIGHT -- X"'"LEAVE BLACK TRAIL-- B"'
34P."LEAVE WHITE TRAIL-- W"'"   LEAVE NO TRAIL-- N"'
35P."REVERSE SCREEN -- R"''
36P."READY?";LINK #FFE3
40 CLEAR4
50aLINK LL0
60 MOVEX,Y
69REM IF Z--LEFT
70IF?#82=#3A;X=X-1;IFX=0;X=X+1
79REM IF X--RIGHT
80IF?#82=#38;X=X+1;IFX=256;X=X-1
89REM IF [--UP
90IF?#82=#01;Y=Y+1;IFY=192;Y=Y-1
99REM IF /--DOWN
100IF?#82=#1F;Y=Y-1;IFY=0;Y=Y+1
109REM IF NOT S--DONT REVERSE
110IF?#82<>50;G.z
120F.A=0TO192;WAIT;MOVE0,A;WAIT;PLOT6,256,A;N.A;MOVEX,Y
129REM IF W--TRAIL=WHITE
130zIF?#82=55;K=13
139REM IF N--TRAIL=NONE
140IF?#82=46;K=12
149REM IF B--TRAIL=BLACK
150IF?#82=34;K=15
160IFL=0;G.x
170PLOT10,0,0
180xL=1
190PLOTK,X,Y;PLOT10,0,0;G.a
```

Congratulations Bill!
You win one Atom software tape or book, courtesy of Niagara MicroComputer, Church Street and Webber Road, FENWICK, Ontario. Contact Gordon Chen on (416) 892-8451 or 735-7998 to claim your prize.

KIDS PAGE

Once again we publish a simple program for our younger readers.

For full sound effects this program needs Toolbox to be fitted. If you do not have this, delete lines 20,30,40, & 180-220

You can add alternative sound with a new line:

```
  200 FOR N=1 TO 5; P.$7; N.N
```

```
 10 REM BLAST OFF BY JOHN M. WOOD
 20 P.$21
 30 LINK 44804
 40 P.$6
 50 P.$12
 60 ?#E1=0
 70 FOR Z=1 TO 16;P.';N.Z
 80 P."          /\         "'
 90 P."         /  \        "'
100 P."        /    \       "'
110 P."       I      I      "'
120 P."       I      I      "'
130 P."       I      I      "'
140 P."      /I      I\     "'
150 P."     / I      I \    "'
160 P."    /  I      I  \   "'
170 P."   /--------------\"'
180 FOR J=1 TO 4
190 FOR K=40 TO 80 STEP 4
200 BE. K,1
210 NEXT K;NEXT J
220 BE.40,1
230 P."     //////\\\\\"
240 FOR N=1TO16;P.';N.N
250 ?#E1=#80
260 END
```

VDU SCREEN MEMORY-MAP ADDRESSES #8ØØØ TO #81FF

(Character/Text and Mode Ø only)

LINES	Ø	1	2	3	4	5	6	7	8	9	1Ø	11	12	13	14	15	16	17	18	19	2Ø	21	22	23	24	25	26	27	28	29	3Ø	31
Ø	8Ø ØØ	8Ø Ø1	8Ø Ø2	8Ø Ø3	8Ø Ø4	8Ø Ø5	8Ø Ø6	8Ø Ø7	8Ø Ø8	8Ø Ø9	8Ø ØA	8Ø ØB	8Ø ØC	80 ØD	8Ø ØE	8Ø ØF	8Ø 1Ø	8Ø 11	8Ø 12	8Ø 13	8Ø 14	8Ø 15	8Ø 16	8Ø 17	8Ø 18	8Ø 19	8Ø 1A	8Ø 1B	8Ø 1C	8Ø 1D	8Ø 1E	8Ø 1F
1	8Ø 2Ø	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	8Ø 3Ø	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	8Ø 3F
2	8Ø 4Ø	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	8Ø 5Ø	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	8Ø 5F
3	8Ø 6Ø	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F	8Ø 7Ø	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	8Ø 7F
4	8Ø 8Ø	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	8Ø 9Ø	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	8Ø 9F
5	8Ø AØ	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF	8Ø BØ	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	8Ø BF
6	8Ø CØ	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	8Ø DØ	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	8Ø DF
7	8Ø EØ	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF	8Ø FØ	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	8Ø FF
8	81 ØØ	81 Ø1	81 Ø2	81 Ø3	81 Ø4	81 Ø5	81 Ø6	81 Ø7	81 Ø8	81 Ø9	81 ØA	81 ØB	81 ØC	81 ØD	81 ØE	81 ØF	81 1Ø	81 11	81 12	81 13	81 14	81 15	81 16	81 17	81 18	81 19	81 1A	81 1B	81 1C	81 1D	81 1E	81 1F
9	81 2Ø	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	81 3Ø	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	81 3F
1Ø	81 4Ø	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	81 5Ø	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	81 5F
11	81 6Ø	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F	81 7Ø	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	81 7F
12	81 8Ø	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	81 9Ø	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	81 9F
13	81 AØ	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF	81 BØ	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	81 BF
14	81 CØ	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	81 DØ	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	81 DF
15	81 EØ	81 E1	81 E2	81 E3	81 E4	81 E5	81 E6	81 E7	81 E8	81 E9	81 EA	81 EB	81 EC	81 ED	81 EE	81 EF	81 FØ	81 F1	81 F2	81 F3	81 F4	81 F5	81 F6	81 F7	81 F8	81 F9	81 FA	81 FB	81 FC	81 FD	81 FE	81 FF

COLUMNS →